Abstracts of Computer Programs to Be Presented at the Second Computer Applications Committee Sessions and Demonstrations, New Orleans, Louisiana, March 18–22, 1990

This represents the first time computer program abstracts have been published by the American College of Cardiology. A total of 135 abstracts were submitted through a separate call for abstracts. Each was graded by nine members of the Computer Applications Committee. Acceptance was based on relative grade ranking.

Meeting time and space allow acceptance of 10 slide presentations, 12 poster presentations and 34 booth demonstrations. Thus, approximately 40% of the abstracts submitted are included in the final program. Many excellent program descriptions were received. We appreciate the interest and effort of all those who submitted abstracts.

Edward A. Geiser, MD, FACC
Chairman, Educational Programs Subcommittee, Computer Applications Committee

David J. Skorton, MD, FACC
Chairman, Computer Applications Committee

Sunday, March 18, 1990
2:00PM–5:00PM
Rosedown Room, New Orleans Hilton
Special Computer Abstract Session

COMPUTER BASED DECISION SUPPORT FOR CARDIAC TRANSPLANT IMMUNOSUPPRESSION

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Dramatic improvement in outcome after heart transplant has been made largely through advances in immunosuppressive management. Credited are new agents and additional experience with multi-drug schemes. However, clinical immunosuppressive decision making has become quite complex and evaluation of therapeutic efficacy often difficult. Furthermore, because of disparate approaches to patient management and frequent unrecognized ad hoc departures from treatment protocols the standardization of therapy required for multicenter trials has not been achieved.

Our goals are to standardize and improve patient management after heart transplant by providing a tool that will objectively assess and consistently apply immunosuppressive protocols and facilitate development of new management strategies by providing a framework to evaluate their clinical utility. We have developed a computer based decision support system that will guide therapeutic immunosuppressive management of heart transplant patients and force objective analysis of protocol deviations.

Our decision support system reflects immunosuppressive management protocols currently in use at The Methodist Hospital/ Baylor College of Medicine Multi-organ Transplant Center. It is based upon clinical experience from 137 transplants performed over 67 months. The system assumes that transplanted patients have received a standard immunosuppressive induction during surgery. Post operatively, it considers indicators of renal dysfunction and hemodynamic data and selects an appropriate regimen. On subsequent consultations it assesses rejection, infection, and toxicity based on data from endomyocardial biopsy, hemodynamic measurements, physical examination, and laboratory studies. If necessary, it makes recommendations for changes in immunosuppressive agents or doses.

The original system was developed on personal computers and employed rule-based reasoning. The current version under development uses both rule-based and object-based methods and is being written in Nexpert Object on Sun workstations. The database for the program is a relational one, implemented in Sybase and the interface is in the X Windows System.

Testing of the program can elucidate reasoning behind protocol departure and provide unbiased management control during long term patient follow-up. We believe this unique program will allow standardized approaches to immunosuppression after heart transplant providing the framework for performance of multicenter clinical trials

APPLICATION OF COMPUTERIZED EXERCISE ELECTROCARDIOGRAM DIGITIZATION-INTERPRETATION IN LARGE CLINICAL TRIALS

Mary Haueisen, BS, Leslee Shaw, MA, Brian Bilgere, BS, Liwa Younis, MD, Karen Stocke, BS, Robert D. Wiens, MD, FACC, Dennis Caralis, MD,MPH, FACC,Bernard R. Chaitman, MD, FACC, St. Louis University Medical Center, St. Louis, MO

This exercise ECG program is written in Microsoft quick basic 2.0 for an IBM PC computer interfaced to a SummaGraphics microgrid 2 digitizer and 16 button bitpad cursor with an illuminated 3 power magnification lens and crosshair. The aim of the program is to determine exercise-induced changes in R wave, J point, and ST segment at 60 msec (ST 60) and 80 msec (ST 80) at rest, peak exercise, and recovery. The QRS onset, peak R wave, and J point are determined, and the ST segment traced from the J point. The ST 60 and ST 80 are determined automatically in three consecutive ECG complexes and measurements averaged. The ST slope values are calculated. Baseline drift is calculated by the worst vertical change in QRS onset between two of the three consecutive complexes. Specific criteria are applied to the measurements to indicate 5 levels of abnormality. A monitor is used to aid the operator in determining measurements through the use of a 1:1 grid displayed on the screen. Key point measurements and operator movements of the cursor are displayed on the screen. An editor function permits changes in measurements after physician overread.

This program has been used to interpret over 8,000 exercise ECGs in the NIH sponsored TIMI and BARI multicenter clinical trials. The program provides rapid and reliable exercise electrocardiographic measurements, overread by physicians, and is suitable for large data collection and storage.